

Impact assessment report

**Project name: Addressing marine plastic debris
from source to sea**

Apple India

March 2026



Contents

Acknowledgements	2
1. Executive summary	3
2. Introduction	5
3. About the study	8
4. Key findings	12
5. OECD-DAC analysis	18
7. Recommendations and way forward	21
8. Annexure	23
List of abbreviations	23
List of Tables	24
List of Figures	24
Caveats	25
Field pictures	26

Acknowledgements

This impact assessment has been undertaken by Grant Thornton Bharat LLP (GTBL) for Apple India as part of the ongoing plastic waste management initiative in Goa.

The team extends its appreciation to Apple India and the World Wide Fund for Nature (WWF India) for their trust and support throughout the assessment process. We are also grateful to field teams for facilitating site visits and stakeholder interactions in Chinchinim, Curtorim, and Cavelossim. We also acknowledge the time and insights shared by waste collectors, Panchayat representatives, Material Recovery Facility (MRF) workers, office staff, and community members who interacted with us during the study.

1. Executive summary

Apple India, in partnership with WWF India, is supporting a plastic waste management initiative in South Goa aimed at reducing leakage of dry waste, particularly plastics, into the environment and marine ecosystem. The project is implemented by WWF India through a service contract with Saahas Zero Waste Management Private Limited (“Saahas”), consultants in solid waste management. The intervention is anchored around a Material Recovery Facility and a network of Panchayat-level collection systems that enable systematic collection, segregation, and channelisation of dry waste from selected villages.

For the assessment year FY 2024–25, the operational model has evolved into a mixed collection system. In Chinchinim, SZW conducts door-to-door collection of plastic and other dry waste, while in Curtorim and Cavelossim the Panchayats operate designated daily collection points for waste handover. The GT team interacted with two door-to-door waste collectors, the Sarpanch and Secretary in Curtorim, 16 workers at the MRF, three office staff, and approximately 25 community members across villages to understand the functioning and perceived impact of the intervention.

Community members consistently reported that the project has substantially reduced the burden of managing dry waste at the household level. Before the intervention, many residents either transported waste to distant locations or resorted to burning it, practices both inconvenient and harmful. With the introduction of regular collection, households no longer need to store, handle, or burn dry waste. Respondents highlighted visible improvements in street cleanliness, reduced open burning, and gradual adoption of waste segregation practices.

Parallel community awareness sessions on dry waste segregation, sanitary waste handling, and household options for organic waste management have supported behaviour change. Residents described more conscious plastic use, better sanitary waste segregation, and growing acceptance of simple composting practices. A recurring suggestion, however, was the inclusion of wet waste collection, as organic waste remains a challenge for many households.

At the facility level, the MRF continues to provide direct employment and stable working conditions for 17 workers and three administrative/operational staff engaged in maintaining documentation. Workers reported better access to safety gear, more predictable working hours compared to previous informal jobs, and a sense of greater dignity in their work. Waste collectors, who interface with households, act as crucial intermediaries, reinforcing segregation messages while enabling regular collection services.

Overall, the intervention remains relevant to local needs by addressing visible dry waste accumulation and associated environmental and health concerns. The mixed collection model door-to-door in Chinchinim and centralised points in Curtorim and Cavelossim demonstrates operational flexibility and leverages existing local governance structures. While the system is still maturing, evidence from

stakeholders points towards early but tangible social and environmental changes, with clear scope to deepen impact by integrating wet waste solutions, expanding coverage, and further institutionalising Panchayat ownership.

Apple India engaged Grant Thornton Bharat LLP to conduct an impact assessment study of the project. The objective of the study was to assess the impact of the activities. The study was conducted in the Margao Industrial Estate, South Goa.

Key findings of the study:

Relevance: The project continues to address the critical challenge of marine plastic pollution in Goa, with enhanced community participation demonstrating strong demand for sustainable waste management solutions. The expanded collection model is highly relevant to diverse village contexts. It aligns with Sustainable Development Goals (SDGs) 6 (Clean water and sanitation), 11 (Sustainable cities and communities), 12 (Responsible consumption and production), 13 (Climate action), 14 (Life below water), and 15 (Life on land).

Effectiveness: The project demonstrates strong effectiveness in waste collection operations and community mobilization. The strategy of door-to-door collection combined with designated collection centres has proved more inclusive than a one-size-fits-all approach. Community satisfaction levels are notably high, with 25 community members reporting significant quality-of-life improvements.

Efficiency: The hybrid collection model optimizes operational efficiency by adapting to local panchayat structures. The engagement of waste collectors combined with 17 MRF workers and other back-end office staff, demonstrates a well-coordinated operational structure spanning collection to processing.

Impact: Substantial positive impacts are evident in community behaviour change. Community members report elimination of waste burning practices, reduction in long-distance waste disposal efforts and improved environmental conditions at the village level. Training on waste segregation and composting has enhanced community capacity for sustainable practices.

Sustainability: The project demonstrates strengthened sustainability prospects through established waste collection mechanisms, demonstrated community commitment, and diversified stakeholder engagement. Community-requested expansion to wet waste collection indicates strong ownership and future scaling potential.

Coherence: The project remains consistent with national and state environmental policies, with enhanced coherence through direct engagement of Panchayat governance structures.

2. Introduction

a. Background and context

Solid-waste management remains a pressing challenge in India, particularly in rapidly urbanising and tourism-driven regions such as Goa. The SAIM baseline study across 35 Gram Panchayats and Margao Municipality documented issues including irregular collection, limited segregation at source, inadequate infrastructure for processing, and frequent reliance on open dumping and burning. In coastal and riverine areas, unmanaged dry waste and plastics exacerbate ecological risks by entering local streams and rivers and eventually contributing to marine litter.

In Goa, the Goa Waste Management Corporation (GWMC) plays a central role in collection and treatment, but the system continues to rely heavily on transport to centralised facilities and on landfilling or partial treatment, with variable levels of segregation and cost recovery. For many Panchayats, GWMC's free collection of cherry-picked waste reduces incentives to invest in comprehensive local systems, particularly for low-value plastics and sanitary waste.

Against this backdrop, Apple India in partnership with WWF India, through its “Addressing Marine Plastic Debris from Source to Sea” programme, conceptualised a decentralised dry-waste management model anchored around a MRF in Nessai IDC, near Margao. The SAIM project seeks to demonstrate the viability of privately operated, decentralised MRFs that work with Panchayats, BWGs, aggregators and contractors on a service-fee basis, while maximising resource recovery and ensuring scientific disposal of sanitary and other difficult fractions.

Waste management in Salcete and project villages

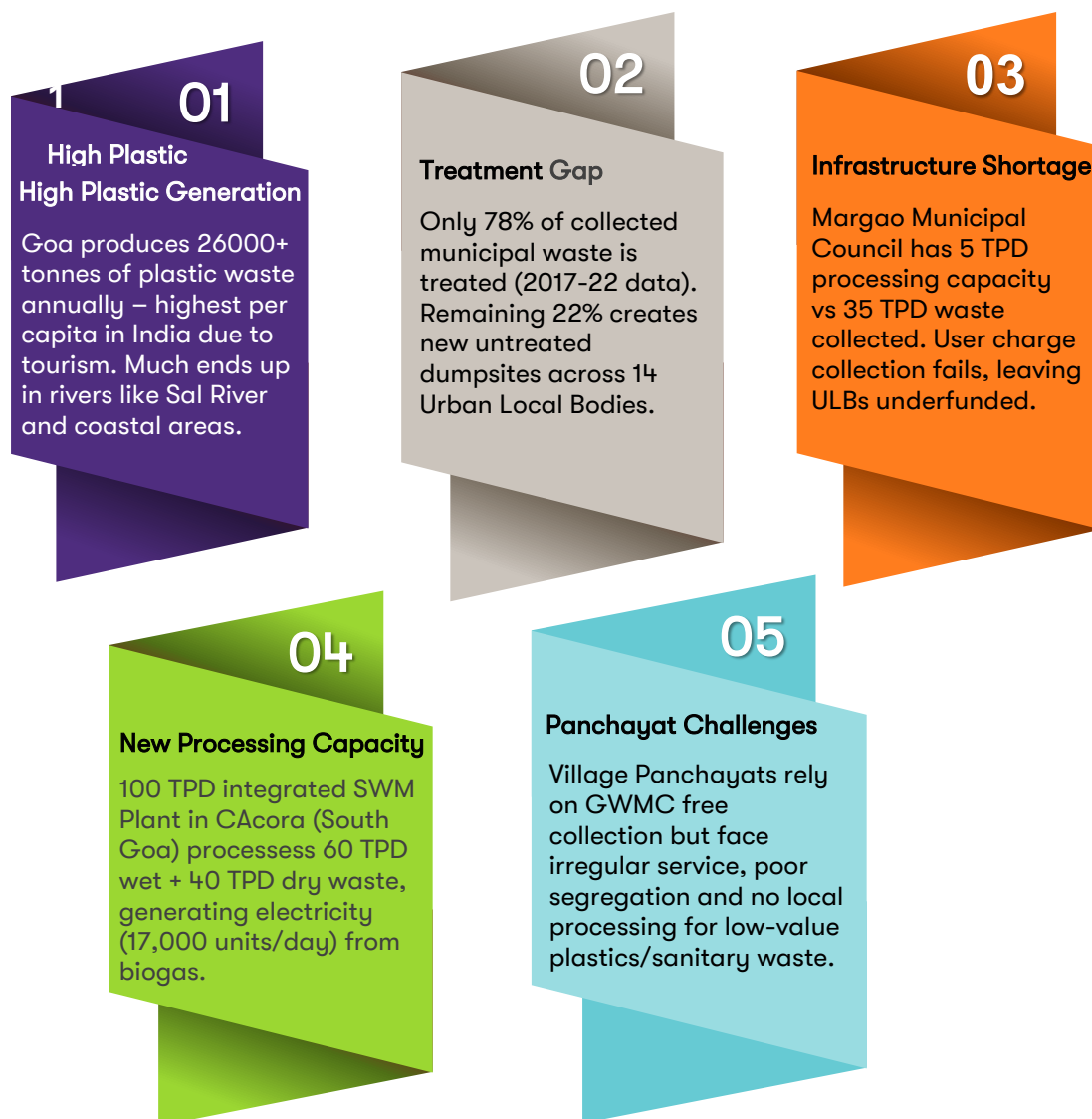
The baseline assessment delineated a catchment area covering Margao Municipality and multiple Panchayats in Salcete and nearby talukas, particularly those located along the Sal rivers and coastal stretches. Within this catchment, the Panchayats of Chinchinim, Curtorim and Cavelossim represent a mix of residential settlements and commercial activity, with varying existing arrangements for waste collection and processing.

In Chinchinim, dry-waste collection is contracted to SZW through an open tender process, with door-to-door services provided once a week across 11 wards divided into five zones. A rented CNG vehicle, supported by collection staff, covers one zone per weekday, typically making three trips to and from the MRF and collecting around 650 kg of dry waste per day, or approximately 13 tonnes per month, in addition to an estimated 2 tonnes per month of sanitary waste.

In Curtorim and Cavelossim, Panchayats maintain daily collection points where residents and small establishments drop off segregated dry waste. From these centres, waste is aggregated and transported to the MRF by SZW, complementing existing GWMC services and providing an avenue for more comprehensive dry-waste management, including low-value plastics. Wet-waste collection is not integrated into this model; households largely manage organic waste through a combination of informal composting, animal feeding and backyard disposal.

b. Waste management in Goa

Figure 1: Waste management in Goa



c. About the project

The SAIM project is designed as a dry-waste-focused intervention with the following features:

- A decentralised MRF at Nessai IDC with a design processing capacity of up to 5 tonnes per day, equipped with a trommel, four conveyor belts, two baling machines and forklifts.
- A business model in which CAPEX is funded by WWF India, while Panchayats, BWGs and contractors are expected to pay service and/or tipping fees for collection and processing—an approach distinct from the conventional PPP arrangements in Goa where infrastructure is often provided by ULBs or GWMC and waste is collected at minimal or no charge.

- Engagement with multiple stakeholders, including Gram Panchayats, GWMC, Goa State Pollution Control Board (GSPCB), aggregators, recyclers, scrap dealers, schools, SHGs and local businesses, to build an integrated dry-waste ecosystem.

Objectives of the project

- Maximise resource recovery from incoming dry waste by segregating into multiple recyclable and RDF fractions.
- Ensure scientific disposal of sanitary and other hazardous components through linkages with CBWTFs and authorised co-processing facilities.
- Improve worker safety, welfare and dignity through compliance with labour laws, EHS standards and gender-sensitive workplace practices.
- Demonstrate replicable collection models (door-to-door, Panchayat collection centres, BWG agreements, aggregator contracts) that can be adapted to different local contexts.

d. Theory of change

Table 1: Theory of change

Resources 	Activities 	Output 	Outcome 	Impact 
• Ideas • Funds • Existing knowledge and expertise • Human resource	• Conduct baseline assessment of Salcete taluka, Goa • Setting up of MRF • Community outreach activities with GPs, BWG, SDs and educational institutes • Awareness campaigns • Marketing activities • Government liaising • Identification of plastic pollution sources • Waste collection and segregation	• No. of gram panchayat reached out • No. of Information, Education, and Communication (IEC) activities conducted • No. of govt. depts. and personnels reached out • No. of agreement signed with GPs for waste collection • A functional MRF in Margao Industrial Estate processing dry waste • Implementation of supportive policies for waste management.	• Improved awareness among stakeholders for waste segregation • Enhanced support from government department and GPs • Increased efficiency of waste management in Salcete taluka through MRF • Increased livelihoods for workers in MRF • Policy and advocacy support at the state level	• To reduce the influx of plastic waste into marine ecosystem into rivers and sea in Goa

3. About the study

GTBL¹ was appointed by Apple India to conduct an impact assessment study of the of the project ‘addressing marine plastic debris from source to sea’. To conduct the assessment, a collaborative approach using the Theory of change and Organization for Economic Cooperation and Development- Development Assistance Committee (OECD-DAC) framework was used to identify key areas of enquiry for each stakeholder group and to obtain a holistic understanding of the project results. The study was executed by interviewing the various stakeholders and beneficiaries of the project to gauge an overall understanding of the outcomes and impact of the activities undertaken. Site visits were made to the MRF in Margao Industrial Estate, to Chinchinim, where door-to-door collection was witnessed and community members were interviewed, to Curtorim and Cavelossim, where Panchayat office was visited to interact with Sarpanch and Secretary. Discussions focused on the regularity and reliability of collection services, the extent of behaviour change among community members, perceived improvements in cleanliness and convenience, working conditions at the MRF, and emerging expectations from the programme.

The assessment included discussions to understand the status of the project and map the progress. The key objectives were:

- Evaluating the project’s impact.
- Gathering feedback of the stakeholders and beneficiaries of the project.
- Analysing and reporting the data collected through interactions with the beneficiaries.

The study aimed to understand the overall impact of the project through analysis of the data collected and further corroborating it with inferences from stakeholder discussions.

a. Assessment approach

For the assessment, the OECD DAC framework was used to critically analyse the project on principles of relevance, effectiveness, efficiency, impact, sustainability, and coherence. To gather data for each of these principles, stakeholders were mapped enabling a robust data collection, analysis, and documentation of findings.

Table 2: OECD DAC Framework

Principles for evaluation	Brief on the principles
Relevance	• To what extent the objectives of the project were suitable as per the need of the area? • Were the activities and outputs of the project consistent with the overall goal and the attainment of its objectives?

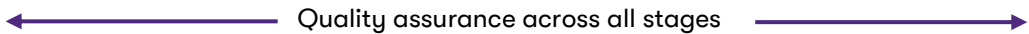
¹ Grant Thornton Bharat LLP or GTBL is a member of Grant Thornton International Ltd. The firm is at the forefront of helping reshape the values in our profession. We are helping shape various industry ecosystems through our work across Assurance, Tax, Risk, Transactions, Technology and Consulting, and are going beyond to shape a more Vibrant Bharat. Our ESG practice constitutes of a dedicated team working to support efforts towards sustainable development. Our team understands the common challenges, and provides tailor-made solutions leveraging on our knowledge, experience, and enthusiasm.

	Were the activities and outputs consistent with the intended impacts and effects?
Effectiveness	- To what extent were the objectives achieved/ likely to be achieved? - What were the major factors influencing the achievement or non-achievement of the objectives?
Efficiency	- Were the activities cost-efficient? - Has the process been documented thoroughly, with controls and checks in place? - Were the objectives achieved on time? - Was the project implemented in the most efficient way compared to alternatives?
Impact	- What has happened because of the project? - What real difference has the activity made to the trainees? - How many people have been affected?
Sustainability	- To what extent did the benefits of a project continue after donor funding ceased? - What were the major factors that influenced the achievement or non-achievement of sustainability of the project?
Coherence	- The compatibility of the intervention with other interventions in a country, sector, or institution. - To what extent the other interventions (particularly policies) support or undermine the intervention, and vice versa.

b. Methodology

The methodology followed to conduct the assessment was spread across three stages.

Table 3: Methodology followed

Stage I: Planning	Stage II: Field visit	Stage III: Reporting
		
- Inception meeting to understand project context, objectives, and approach. - Review of available documents and reports to assess the status of the initiatives - Assessment design including identification of key stakeholders and areas of enquiries. - Study design including identification of key	- Development of tools for data collection. - Conduct onsite discussions with relevant individuals and stakeholders.	- Prepare draft narrative report, discuss report findings, obtain relevant inputs for final report. - Preparing and issuing final report.

stakeholders and areas of enquiries.

c. Data collection

Stakeholder wise tools were created for primary interactions. Stakeholders such the project team and the facility workers were covered through Focused group discussions (FGD). Other stakeholder such as panchayat members, community members, waste collectors were covered through In-Depth Interviews (IDI).

Physical visits were conducted in Goa and discussions were held with the following stakeholders.

Table 4: Stakeholder sampling and key areas of enquiry

S/N	Stakeholder	Sample covered	Type of tool	Key areas of enquiry
1.	MRF office/administrative staff	4	FGD	• Understanding facility set up and operations • Legal compliances and safety of operations • Awareness, outreach, and training activities • Mapping of plastic/dry waste hotspots • Stakeholder engagement • Revenue streams • Employment generation • Project sustainability • Challenges and suggestions
2.	Panchayat member	2	IDI	• Project association and Implementation • Collaboration with the facility • Awareness, outreach and capacity building • Meetings and Discussions • Waste collection process • Improvements in Waste Management • Environmental impact • Challenges faced • Recommendations and feedback
3.	Community members	~25	IDI	• Project awareness • Sources of plastic and dry waste pollution • Awareness, outreach, and capacity building • Feedback • Challenges faced • Recommendations

S/N	Stakeholder	Sample covered	Type of tool	Key areas of enquiry
4.	Waste collectors	2	IDI	• Type of scrap • Scrap sources • Source segregation • Collaboration • Compliance • Challenges and suggestions
5.	MRF workers	17	FGD	• Previous employment • Recruitment process • Project understanding • Work environment • Benefits and facilities • Social impact • Training programs • Safety measures • Challenges and suggestions

d. Limitation of the study

- A limited number of stakeholders could be interviewed due to hesitance from community members to interact and the limited availability of SDs, BWGs, and panchayat members.
- The Panchayat member or Sarpanch of Cavelossim could not be interviewed, as they were not present or available during the data-collection visits to the Panchayat office.
- The fieldwork relied on purposive qualitative sampling and is not statistically representative of all households or workers in the catchment.
- Quantitative analysis uses the project's own datasets and progress reports; while these are regularly maintained, they were not independently verified during this assignment.



Figure 2 - Interaction with Panchayat Secretary (Ankita) of Curtorim village



Figure 3 - Interaction with community members of Chinchinim village

4. Key findings

a. Relevance

Goa has been struggling with a growing plastic waste problem, shaped both by local consumption patterns and the large number of tourists who visit the state each year. Recent estimates suggest that Goa generates **around 29,000 tonnes of plastic waste annually between 2018 and 2024**, placing it among the highest per-capita plastic waste generators in the country.² Earlier assessments by the Central Pollution Control Board also recorded **about 26,000 tonnes of plastic waste per year in 2019–20**, indicating that this has been a long-standing issue rather than a recent spike.³ Tourist behaviour intensifies the situation significantly: while an average resident generates about **46 grams of plastic waste daily**, a tourist produces nearly **102 grams per day**, primarily because of their dependence on packaged food, bottled water, and other disposable items.² Meanwhile, reports highlight a surge in **non-recyclable plastics**, including multilayer packaging and single-use carry bags, which often end up on beaches, riverbanks, and public spaces, leading to visible and persistent environmental damage.⁴

The assessment confirms that significant gaps existed in plastic and dry-waste management in coastal and peri-urban areas of Salcete prior to the SAIM intervention. Panchayat-level stakeholders and community members described systems characterised by irregular collection, minimal segregation, open dumping and burning of dry waste, and limited local options for safe disposal of plastics and sanitary waste. These practices not only affected village cleanliness and public health but also increased the risk of waste entering nearby rivers and coastal zones.

The project directly addresses these gaps by:

- Establishing a decentralised MRF for multi-fraction segregation and recovery of dry waste from multiple Panchayats and BWGs.
- Introducing structured collection systems like door-to-door and Panchayat collection centres that provide households with accessible, predictable channels for dry-waste disposal.
- Integrating IEC and behaviour-change campaigns that promote source segregation, sanitary-waste handling and home composting, thereby targeting the behavioural drivers of poor waste practices.

In the three focus Panchayats, these design elements align closely with expressed community needs. Community members emphasised that the main difference made by the project is the removal of the need to burn or transport dry waste themselves and the assurance that someone will collect or accept segregated dry waste regularly.

² The Goan EveryDay: Tackling plastic waste with robust recycling

³ Goa - Plastic Smart Cities

⁴ World Environment Day: Goa Struggles with India's Highest Plastic Waste Per Capita – 5 June 2025 | O Herald

Sarpanch and Secretary in Curtorim highlighted that the link with the MRF allows them to manage dry waste more responsibly and visibly, complementing their broader cleanliness and environmental priorities.

b. Effectiveness

Stakeholders reach and behaviour change

SAIM's IEC and capacity-building portfolio has achieved considerable reach in a relatively short period. Project documentation indicates that, over eight months multiple activities such as capacity-building sessions for Panchayat members, SHG home-composting sessions, school awareness events, street plays, clean-up drives and carnival campaigns were conducted.

3,671 individuals
engaged across **29 village**
Panchayats through
community engagement
activities

At the community level in Chinchinim, Curtorim and Cavelossim, these efforts, combined with regular collection, have contributed to noticeable behaviour change:

- Most households interviewed now maintain separate containers for dry and wet waste and report regularly handing over dry waste to collectors or at Panchayat centres.
- Community members recalled specific messages from IEC sessions on the importance of segregating sanitary waste and now commonly wrap and hand over such waste separately, informing the collector at the time of pickup.
- Several respondents indicated that they had either attended or heard about home-composting demonstrations, and some households had begun experimenting with simple composting methods for kitchen waste, although this is not yet universal.

Improvements in waste handling and compliance

At the MRF, training and process controls have enhanced waste handling and compliance with safety and environmental norms. Workers receive orientation and refresher sessions on waste categorisation, EHS protocols, POSH, first aid, and use of IoT-enabled dashboards for data entry. Health-and-safety measures include annual health check-ups, provision of PPE, separate restrooms for men and women, overtime policies and restrictions on women working beyond 7:30 pm.

Operationally, the facility segregates incoming mixed dry waste into more than 22 primary fractions and an additional 8–10 secondary categories, and ensures that sanitary waste is channelled to a CBWTF and RDF to cement kilns, while recyclables are dispatched to registered aggregators and recyclers. Monthly data for July and September 2024 and March 2025 show sorted quantities broadly matching inward flows (20.8–25 tonnes per month) and significant baled quantities (8.5–24.1 tonnes), indicating that the facility is able to keep pace with inflows and avoid excessive stockpiling.



Figure 4 - Details pertaining to total inward quantity for FY 2024-25 on dashboard

c. Efficiency

Operational arrangements and resource use

The SAIM model demonstrates efficiency at both collection and facility levels, while contending with systemic constraints.

At the collection level:

- The Chinchinim door-to-door model uses a single CNG vehicle and a small collection team to serve five zones over five days, averaging around **650 kg/day and 13 tonnes/month of dry waste, plus 2 tonnes/month of sanitary waste**. This route-based deployment, with three trips to the MRF per day, maximises vehicle utilisation within working-day constraints.
- Curtorim and Cavelossim use Panchayat collection centres that leverage existing public spaces and staff, reducing additional infrastructural investment while still enabling regular evacuation of dry waste.

At the MRF:

- Staffing is organised along the process flow: two staff for bag opening and feeding to the trommel, six women sorters on the main conveyor for primary segregation, six staff for secondary sorting of mixed plastics, four workers on balers, and supervisory and administrative staff who also manage data and coordination.
- The facility processes around **0.9–1.4 tonnes/day and 24–36.1 tonnes/month**, with monthly outward quantities often matching or exceeding inward flows due to dispatch of accumulated stock.
- Revenue from sale of recyclables and low-value plastics ranges from approximately **INR 1.3–2.28 lakh per month** in the months with available data.

However, the cost structure is challenging. Disposal of RDF at around INR 3/kg and sanitary waste at INR 22/kg, combined with expectations of low or no fees from Panchayats and BWGs, constrains financial margins and underscores the need for improved cost-recovery mechanisms.

Continuous training of workers and integration of IoT-based monitoring (e.g., dashboards for tracking inflows, sorting and baling) contribute to efficient operations. MRF staff reported that periodic training helps them sort more accurately and handle materials safely, reducing re-work and contamination. At the same time, workers highlighted that physical strain and workload during high-inflow periods can be demanding, suggesting that planned additions of sorting staff and capacity expansion to 2–3 tonnes/day will be important for maintaining efficiency.

Environmental impact

- In FY 2024–25, the SAIM MRF managed around 165 tonnes of outward material, of which approximately 98% was diverted from landfill through recycling and RDF co-processing pathways.

- Sanitary waste was routed to a CBWTF for scientific treatment, reducing the risk of unsafe disposal in the environment.
- The SZW's greenhouse-gas assessment estimates that the intervention avoided about **149 tCO₂e, equivalent to emissions from 63,560 litres of petrol or 75 tonnes of coal, or sequestration by roughly 2,467 tree seedlings over ten years.**

At the village level, residents and Panchayat leaders reported less visible dry-waste dumping along roads, fewer small-scale fires for burning waste, and improved cleanliness in public spaces. Activities such as black-spot clean-up and beautification, including installation of handmade wooden bins with behavioural signage, have reinforced these gains in specific locations.

Social and economic impact

The project has also generated socio-economic benefits.

- **Employment:** The MRF and collection operations provide full-time employment to roughly 18 facility workers plus collection personnel with a female to male ratio of 2:1 among facility workers. **Workers described improved job security, regular wages, safer working conditions and greater social recognition** compared to earlier informal work.
- **Community burden reduction:** Households now spend less time and effort managing dry waste, no longer needing to walk long distances or find informal dumping locations, which is particularly beneficial for older residents and women responsible for household chores.
- **Behavioural change:** Regular interactions with waste collectors and IEC activities have helped normalise segregation and hygienic sanitary-waste disposal and have prompted some adoption of home composting practices.

Institutional impact

The project has also seen notable impact on institutions.

- **Panchayat capacity building:** Curtorim Sapanch noted structured collection centres have integrated waste management into Gram Sabha agendas, enabling better monitoring and community engagement.
- **Systematic integration:** SAIM's category III empanelment and GWMC discussions position it as a complement to Category I expansion (dry + food waste).

e. Coherence

The SAIM project is broadly coherent with national and state policies on solid-waste and plastic management. It aligns with principles under the Solid Waste Management Rules, Plastic Waste Management Rules and extended producer responsibility (EPR) frameworks by promoting segregation at source, decentralised processing, and linkages with authorised recyclers and co-processors.

Institutionally, the project has obtained empanelment under Category III (dry-waste collection only) and renewed registration from GSPCB for waste collection, valid up to October 2025. Engagements with GWMC, GIDC and local Panchayats on waste diversion and potential relocation of the MRF indicate efforts to embed the model within existing governance structures. At the same time, the presence of free GWMC collection and informal contractors offering low-cost services sometimes undermines the uptake of service-fee-based models, creating tensions that the project is attempting to manage through advocacy and partnerships.

GOA STATE POLLUTION CONTROL BOARD
गोंय राज्य प्रदूषण नियंत्रण मंडळ
 (An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Board)

Phone Nos. : 0832-2407700, 2407701, 2407703
 Email Ids: Chairman, GSPCB: chairman-gspcb.goa@nic.in
 Member Secretary, GSPCB: ms-gspcb.goa@nic.in
 Office: mail.gspcb@gov.in

No:2025/GSPCB/Letter/24409/Tech/2-210 Date: 07/02/2025

RENEWAL OF REGISTRATION AS A WASTE COLLECTOR

Ref:- Your application No.24409 dated: 09/01/2025 seeking for Renewal of Registration as a Waste Collector.

The GSPCB hereby authorize, M/s. Saahas Waste Management Pvt.Ltd, Located at Plot No.13 & 14, Phase I, Margao Industrial Estate, Nessai Salcete Goa 403709, for collection, Segregation and bailing of dry waste as follows:

Sr. No.	Name of Product	Quantity
1	Dry waste such as Glass, Craft papers, metals, tetra Packs, Hard Plastic, Papers/Cardboard, Aluminium Cans/Containers, PET, Clothes, Mix Plastic, NonRecyclable, waste scrap	10 Tons/day

This Renewal of registration shall be valid up to 03/10/2025 and is subject to the following terms & conditions:

Terms and Conditions Under Registration

- The Unit shall obtain Water Consent under the Water (Prevention & Control of Pollution) Act, 1974 (6 of 1974) and the Air (Prevention & Control of Pollution) Act, 1981 (14 of 1981), if applicable.
- Every application for renewal of registration shall be made at least 60 days before the expiry of the validity of registration.
- This registration is granted without any prejudice to any other permission(s) required under any laws, by-laws and regulations in force.
- The applicant should construct non permeable concrete platform for storage of the non-biodegradable waste.
- Daily waste records to be maintained for waste received and disposed (with disposal details) under respective categories i.e re-cyclables, non re-cyclables, under individual headers (e.g. glass, metal, plastic etc) and same to be made available to Board official as & when required.

Page 1 of 5
 Near Pilerne Industrial Estate, Opp. Saligao Seminary, Saligao - Bardez, Goa - 403 511

Figure 6 - Waste Collector Certificate

GOA STATE POLLUTION CONTROL BOARD
गोंय राज्य प्रदूषण नियंत्रण मंडळ
 (An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Board)

Phone Nos. : 0832-2407700, 2407701, 2407702, 2407703
 Email Ids: Chairman, GSPCB: chairman-gspcb.goa@nic.in
 Member Secretary, GSPCB: ms-gspcb.goa@nic.in
 Office: mail.gspcb@gov.in

No. 12/2024-PCB/2135103/G00014998 Date: 17/05/2024

Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981.

[To be referred as Water Act and Air Act Rules respectively]

CONSENT TO OPERATE is hereby granted to:

M/s. SAAHAS WASTE MANAGEMENT PVT LTD.
 (Unit Representative Smt. Wilma Rodrigues)
 (Green Category)

Plot No. 13 & 14,
 Margao Industrial Estate,
 Sao Jose de Areal, Salcete- Goa.

Located in the area declared under the provisions of the Water Act and Air Act, subject to the provisions of the Act and the Rules and the Orders that may be made further and subject to the following terms and conditions:

- This Consent to Operate is issued valid upto 22/12/2038.
- This Consent to Operate is valid for the operation of:

Sr. No	Description	Quantity
1.	Sorting and Bailing Station for dry waste	10 TPD
- CONDITIONS REQUIRED TO BE COMPLIED UNDER THE WATER ACT:**
 - The daily quantity of industrial effluent from the unit shall not exceed NIL.
 - The daily quantity of domestic effluent from the unit shall not exceed 2.5KLD.
 - Domestic Effluent treatment and Disposal:-**
 The domestic wastewater shall be treated in a properly designed septic tank and discharged on land for percolation through soak pit of adequate size within the unit premises.

Near Pilerne Industrial Estate, Opp. Saligao Seminary, Saligao, Bardez, Goa-403 511

Figure 7 - Consent to Operate Certificate

f. Sustainability

The sustainability of the SAIM model depends on three interlinked dimensions: institutional anchoring, financial viability and community ownership.

- **Institutional anchoring:** Empanelment with GWMC and registration with GSPCB provide a regulatory foundation; ongoing discussions on category upgrade (to include food waste) and potential relocation indicate a trajectory towards longer-term integration in the state's waste-management architecture. Panchayat-level engagement—through tenders in Chinchinim and proposals to Curtorim, Cavellossim and other Panchayats—lays the groundwork for more formalised partnerships.
- **Financial viability:** While the MRF has demonstrated the ability to generate revenue from material sales and low-value plastics diversion, cost pressures from transport, RDF and sanitary-waste disposal, and limited willingness of Panchayats and BWGs to pay, constrain full cost recovery. Efforts to expand upstream partnerships, map recyclers, and refine service-fee models are essential for sustainability.
- **Community ownership:** High levels of satisfaction with dry-waste services and strong demand for integrated wet-waste solutions indicate growing community ownership and expectations. If harnessed, this can support more robust user-fee or cost-sharing mechanisms in the future; if unmet, it may limit long-term support for the current model.

5. OECD-DAC analysis

Table 5: OECD-DAC analysis

DAC Principles	Analysis
Relevance	• The project addresses critical gaps in plastic and dry-waste management in coastal Goa and is well aligned with community needs and environmental priorities. • The project aligns with multiple SDGs: ○ SDG 6- By reducing plastic pollution, the project contributes to improving water quality and preventing contamination of marine and freshwater sources. ○ SDG 11- The project promotes sustainable waste management practices at the local level, ensuring cleaner and healthier communities. ○ SDG 12- The initiative encourages proper waste segregation and recycling. ○ SDG 13- Proper waste management contributes to mitigation greenhouse gas emissions from plastic waste incineration and decomposition. ○ SDG 14- The project aims to reduce marine litter and protect aquatic ecosystems from plastic pollution. ○ SDG 15- By preventing plastic waste from entering natural habitats, the project helps protect territorial ecosystems and biodiversity.
Effectiveness	• Stakeholder reach and observable behaviour change in the three focus Panchayats demonstrate that the project's objectives around segregation, safe disposal and awareness are being progressively achieved. • The establishment of the MRF, equipped with advanced machinery and safety measures, signifies a meticulously planned operational framework. • The project has successfully executed awareness campaigns and training programs for various stakeholders, including panchayats, community members, and BWGs.
Efficiency	• Despite systematic cost challenges, the use of mixed collection models, multi-source feedstock

DAC Principles	Analysis
	and process-driven MRF operations indicates efficient use of resources and human capital. • The MRF's ability to sort waste into 25 categories, along with its collaborations with local stakeholders, enhances resource utilization. • The training program for MRF workers, which includes a two-day observation period and orientation, equips them with the necessary skills to perform their tasks effectively.
Impact	• The project has delivered measurable environmental outcomes (landfill diversion, GHG reduction), socio-economic benefits (employment, reduced household burden, enhanced dignity of workers) and visible improvements in local cleanliness. • The MRF employs 17 workers and offers them coverage under ESI and PF schemes, ensuring their health and financial security and improving worker welfare. • The awareness and outreach activities have reached a large number of stakeholders, fostering a culture of sustainable waste management practices in the community.
Sustainability	• The project has established a strong operational and institutional base but must address financial viability and the wet-waste gap to ensure longer-term sustainability and potential replication.
Coherence	• The project aligns well with national and local environmental policies, including the India Plastics Pact, Solid Waste Management Rules 2016, and the GWMC Act 2016. • Its collaborative approach with government bodies, local panchayats, and private stakeholders ensures coherence with broader waste management initiatives.

6. Success stories

“Earlier, we’d store mixed waste a few days, then burn it or carry heavy bags to distant spots,” shared the resident. “Smoke irritated our children and carrying waste felt unsafe after dark.” SAIM brought weekly collection. “They taught us to separate dry waste and wrap sanitary items separately. Now we hear the vehicle’s song and hand over a ready bag - no more thinking where to dump.”

The neighbourhood transformed. **“Our lane looks cleaner. We rarely see burning fires or plastic litter anymore. Even neighbours who were reluctant now segregate regularly.”**

Wet waste is the remaining hurdle. “If they help us with simple composting methods, it would solve everything for our household.”

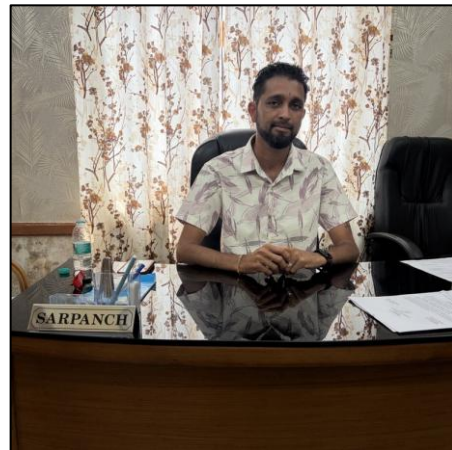


Josefina – Community member, Chinchinim

Curtorim Panchayat adopted a collection-centre model linked to the SAIM MRF. The Sarpanch coordinated daily drop-off points and IEC sessions with the project team.

“Before SAIM, dry waste piled up along roadsides and markets. People burned plastics or dumped them informally. GWMC trucks came irregularly, and segregation wasn’t enforced,” the Sarpanch explained.

When the project started, SZW designated a central collection spot and organised street plays and composting demos. “Residents now know exactly where to bring segregated dry waste. It’s transported to the MRF for proper processing.”



Joaquim C. Estibero - Sarpanch, Curtorim

The change is visible. **“We see far fewer plastic packets and bottles scattered around. Roads are cleaner and waste is now discussed constructively at Gram Sabha meetings. Visitors notice the difference too.”** Overall, We are extremely satisfied with the waste collection efforts in our area and the positive impact it has had on our community.

7. Recommendations and way forward

The SAIM project, supported by Apple India and implemented by WWF India and Saahas Zero Waste, demonstrates that a decentralised, service-fee-based MRF model can deliver meaningful improvements in dry-waste management, even within a challenging ecosystem such as coastal Goa. In Chinchinim, Curtorim and Cavelossim, households have shifted from burning or dumping dry waste to regular segregated handover, Panchayats have gained a more structured solution for managing dry waste, and workers have accessed more secure and dignified employment opportunities.

To build on these gains, the following areas merit attention:

Table 6: Recommendations

S.No.	Areas of improvement	Recommendation
1.	Deepening behaviour change and segregation quality	- Continue targeted IEC in the Panchayats with a focus on reinforcing practical segregation habits, correct sanitary-waste presentation and reduction of residual burning. - Use community champions and SHGs to sustain peer-to-peer messaging and monitor black-spot re-emergence.
2.	Addressing the wet-waste gap	- Design a wet-waste management that expands home-composting support (eg. SHG-led demonstrations, starter kits) and explores small-scale community solutions in dense areas. - Align future wet-waste pilots with SAIM's ongoing request for Category I empanelment and with GWMC infrastructure, to avoid duplication and ensure regulatory coherence.
3.	Strengthening operational efficiency and worker welfare	- Implement planned capacity increases (2-3 tonnes/day) and additional sorting staff to reduce physical strain and better manage peak inflows. - Institutionalise periodic ergonomics and safety training, along with enhanced recognition schemes, to sustain morale and productivity.

S.No.	Areas of improvement	Recommendation
4.	Enhancing financial sustainability	- Continue advocating service-fee models with Panchayats and BWGs, supported by clear communication on environmental and social benefits and transparent cost breakdowns. - Explore diversified revenue streams, including long-term contracts with recyclers, collaborative arrangements with GWMC and potential CSR co-funding for specific components such as sanitary waste management.
5.	Scaling and replication	- Document the performance of the Chinchinim door-to-door model and the Curtorim/Cavelossim collection-centre model as distinct case studies, highlighting context conditions, costs and outcomes to guide replication in other Panchayats. - Use learnings from these pilots to refine criteria for onboarding new Panchayats and BWGs and to inform the broader decentralised waste-management strategy in Goa.

With these enhancements, SAIM can move from demonstrating successful dry-waste management in selected Panchayats to serving as a robust, scalable model for integrated waste management in Salcete and similar coastal regions, contributing to Apple India's broader objectives of reducing marine plastic pollution from source to sea.

8. Annexure

List of abbreviations

BWG	Bulk Waste Generator
CTE	Consent to establish
CTO	Consent to operate
ESI	Employees' State Insurance
FY	Financial year
FGD	Focus Group Discussion
GIDC	Goa Industrial Development Corporation
GSPCB	Goa State Pollution Control Board
GWMC	Goa Waste Management Corporation
GP	Gram Panchayat
GTBL	Grant Thornton Bharat LLP
IDI	In-Depth Interview
IEC	Information, Education, and Communication
LLP	Limited Liability Partnership
MRF	Materials Recovery Facility
NOC	No Objection Certificate
OECD-DAC	Organization for Economic Co-operation and Development - Development Assistance Committee
PPE	Personal protective equipment
PCB	Printed circuit board
PI	Professional Indemnity
PF	Provident fund
SD	Scrap Dealer
SDG	Sustainable Development Goals
TPD	Tonnes per day
ULB	Urban Local Bodies
WWF	World Wide Fund for Nature

List of Tables

Table 1: Theory of change	7
Table 2: OECD DAC Framework.....	8
Table 3: Methodology followed	9
Table 4: Stakeholder sampling and key areas of enquiry.....	10
Table 5: OECD-DAC analysis.....	18
Table 6: Recommendations	21

List of Figures

Figure 1: Waste management in Goa	6
Figure 2 - Interaction with Panchayat Secretary (Ankita) of Curtorim village	11
Figure 3 - Interaction with community members of Chinchinim village	11
Figure 4 - Details pertaining to total inward quantity for FY 2024-25 on dashboard	14
Figure 5 - Details pertaining to total outward quantity for FY 2024-25 on dashboard	15
Figure 6 - Waste Collector Certificate	17
Figure 7 - Consent to Operate Certificate	17
Figure 8 - Door-to-door waste collection	26
Figure 9 - Segregated waste being handed over to the waste collector during door-to-door waste collection	26
Figure 10 - Waste being sorted at MRF	26
Figure 11 - Segregated waste kept outside house for collection	26
Figure 12 - Plastic waste along with segregated sanitary waste kept outside house for collection	27
Figure 13 - Level 1: Workers sorting plastic waste.....	27
Figure 14 - Interaction with the workers engaged at MRF	27

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- Owing to communication gap and the inherent human instinct to report everything as above-expectations and glitch-free, it was challenging to make interviewees understand the purpose of the survey and ensure that correct data was accordingly gathered. In the absence of baseline data, responses for retrospective questions are based on the respondents' ability to recall past information.
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Field pictures



Figure 8 - Door-to-door waste collection



Figure 9 - Segregated waste being handed over to the waste collector during door-to-door waste collection



Figure 10 - Waste being sorted at MRF



Figure 11 - Segregated waste kept outside house for collection



Figure 12 - Plastic waste along with segregated sanitary waste kept outside house for collection



Figure 13 - Level 1: Workers sorting plastic waste



Figure 14 - Interaction with the workers engaged at MRF